

HEAVE**PURPOSE**

Compute the Heaveside function.

DESCRIPTION

The Heaveside function is equal to 1 if the input value is greater than or equal to zero and equal to 0 otherwise. DATAPLOT also allows 2 optional parameters, say A and B. Then the function is equal to 1 if the input value is between (inclusive) A and B and equal to zero otherwise. If no second argument is given, it is assumed to be zero and if no third argument is given, it is assumed to be machine infinity.

This second form is useful for defining functions that vary over different ranges of the input variable. For example, to define a function that is X^2 for positive values and X^3 for negative values, enter the following command:

```
LET FUNCTION F = X**2*HEAVE(X) + X**3*HEAVE(X,-3.4/10**37,0)
PLOT F FOR X = -5 0.01 5
```

Note that this method does NOT protect against invalid arithmetic operations such as division by zero or the square root of a negative number.

SYNTAX

```
LET <y> = HEAVE(<x>,<a>,<b>) <SUBSET/EXCEPT/FOR qualification>
```

where <x> is a number, parameter, or variable;

<a> is an optional number, parameter, or variable which defines the lower cut-off value;

 is an optional number, parameter, or variable which defines the upper cut-off value;

<y> is a variable or a parameter (depending on what <x>, <a>, and are) where the computed heaveside function is stored; and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

```
LET A = HEAVE(X)
LET A = HEAVE(X,4)
LET X2 = HEAVE(X,0.5,1.0)
```

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

ABS	=	Compute the absolute value of a number.
SQRT	=	Compute the square root of a number.
EXP	=	Compute the exponential of a number.
MOD	=	Compute the modulo (i.e., the remainder of x/y) of two numbers.
MIN	=	Compute the minimum of two numbers.
MAX	=	Compute the maximum of two numbers.
DIM	=	Compute the positive difference of two numbers.

APPLICATIONS

Elementary function

IMPLEMENTATION DATE

95/4

PROGRAM

```
TITLE AUTOMATIC
Y1TIC OFFSET 0.1 0.1
MULTIPLY 2 2; MULTIPLY CORNER COORDIANTES 0 0 100 100
PLOT HEAVE(X) FOR X = -5 0.01 5
PLOT HEAVE(X,2) FOR X = -5 0.01 5
PLOT HEAVE(X,1,4) FOR X = -5 0.01 5
PLOT HEAVE(X,4,1) FOR X = -5 0.01 5
END OF MULTIPLY
```

